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		In reply refer to:
Attention:		
Subject:	Contract RD-103; BR-16 Communications Equipment	
Gentlemen:		
dated 27 April Communications	1959, for design, development and fak	d a proposal, prication of BR-16
	Through an administrative error, Page the estimated cost breakdown for Ite it "C" shows the estimated cost break	ems 1 and 2; in addition,
	Contractor wishes to inform the Gover on Page 1 applies to Items 1 and 3 ar ge 2 applies to Item 2.	
	Very	truly yours,
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Attention:						
Subject:	Contract RD-1 Additional wo	03 Propose	l;			
Gentlemen:			-			
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EXHIBIT #A"

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STATEMENT OF WORK

Item 1. Design, develop, and fabricate one (1) transportable Field Unit Receiving Set, designated BR-16, including spare parts and simulator.

Item 2. Fabricate additional BR-16 sets, including spare parts and simulators.

Item 3. Informal Instruction Manual.

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EXHIBIT "R"	EXHIST	"Be
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TECHNICAL DISCUSSION

The following discussion outlines the method by which the Contractor currently expects to proceed with the work opvered by this proposal. This Exhibit is not indended to modify or limit the Statement of Work as set forth in Exhibit "A".

An operational need has been envisioned requiring highly transportable equipment, designated the BR-16, capable of receiving and recording RS-16A and RS-16B Field Unit transmissions. Currently, these transmissions are being received and recorded by the large AS-4 and AS-4A Base Terminals. However, this new concept will permit receiving equipment to be located at strategic positions now denied the larger Base Terminals. The proposed BR-16 may be stationed at Sub-Base installations as a result of making it compact and easily transportable. Use of this new equipment has the further advantage of releasing the larger Base Terminals for high-speed, high-volume traffic for which they were primarily designed.

During preliminary discussions with Government engineers, it was agreed that the approach will be along lines now being established by the AS-5 Sub-Base Communication Equipment. It is planned that two packing cases will comprise the system. One case will contain receiving, recognition and logic elements, and the other case will contain the recorder and system power supplies. Insofaw as is possible, AS-5 designs will be used; however, in those areas where now designs are necessary, techniques similar to those used in the AS-5 will be employed. Because of somewhat similar field operation conditions between the AS-5 and the BR-16, the underlying philosophy will be to make the units similar in order that training of operating and maintenance personnel, as well as obvious logisties problems, may be similarised.

The receiver case will contain one r-f front end, five i-f emplifiers and five crystal filters. These items are all now being developed for the AS-5 equipment. In addition, the receiver component will contain a recognition unit similar to the one being used in the AS-5. The AGC, threshold inverter, recorder driver, and other circuits will be modularised and may be either identical or very similar to their corresponding counterparts in the AS-5. Wirevrapped module boards will provide the bulk of all interconnections.

The second packing case will contain the visicorder which will be purchased and modified, as is done in the case of the AS-5. The system power supplies, which will be in the main new designs, will be located in the second case adjacent to the visicorder. The power supply will have two sub-units. One will regulate line voltage, and the other will provide all mecessary DC voltages to the system.

One inherent disadventage of this proposed system is its lack of receiver diversity, although careful selection of receiving locations and operating frequencies will definitely help. The inclusion of diversity reception

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EXHIBIT "B"

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in the BR-16 has been avoided in order to optimize portability and to preserve space. In many locations, it may be difficult to erest separate antennae, particularly if they occupy a large area, as would conventionally be in the case when a pair of rhombics are employed. By emitting receiver diversity, this area as well as the size and weight of the system are substantially rejuced. While actual field tests of predocessor equipment slearly show the virtues of receiver diversity, it is intended that the increased portability offered by the proposed system will allow its use in locations where diversity reception is not essential to successful operation.

If under extensive use, it is shown that diversity reception would substantially increase the effectiveness of the system, then the equipment can at a later date be easily retrofitted. The proposed system will be constructed with this object in mind. Pertinent wiring will be brought out to a connector so that a third drawer, containing a second receiver front and together with diversity combining circuits may be in the future easily added if desired. In this case, the added area required for the extra antenna may possibly be minimized by employing a horizontal long-wire together with a vertical whip to provide planization diversity.

A simple test simulator will be designed, packaged and located in the receiver case. This device will function to generate a group of palses representing all marks for reaggnition, an RY pattern, or a standard message pattern convenient for testing. This will be accomplished by a group of standard modules and a tuning fork cacillabor. The tuning fork will act as the stable frequency source. The pulse output of this logic will be converted to r-f in 2 ke steps at some frequency within the pass band of the receiver. This technique is similar to that employed so successfully in the AS-4 pulse and r-f simulators. To certify that the equipment is performing correctly, the operator switches the r-f front-end tarret to the "test" channel, and after suitable warm up time, depresses the TEST button. This action causes an electronically generated test signal to be transmitted to the receiver front end and thence thru the entire system where it finally appears as recorded pulses from the output device. A brief study of the simulated message will reveal the status of the equipment.

Spares are included in this proposal on the basis of one module for each different type of active module used. If the number of identical modules is large, then two spares will be included. Other miscellaneous components will also be included as spares, if experience indicates the need.

Minimum drawings, including schematics, are a part of this proposal. In this case, minimum refers to those drawings necessary for use by model shop and skilled factory personnel to fabricate and partially test all units following the first. Final testing will be accomplished by engineering.

Item 2, the unit cost for febrication of additional RR-16 Receiver units, is quoted separately. In the small quantities requested by the cognisant Government engineer, no appreciable cost differential can be effected for fabrication of additional units. Therefore, all RR-16 units following the

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the first are identical in cost shown in the Estimated Cost Summary.

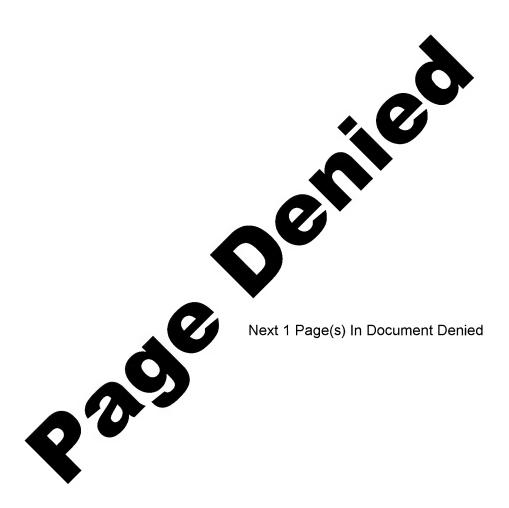
An informal instruction manual, listed as Item 3 in the Statement of Work, is also a part of this proposal. This document will cover theory, operation and maintenance of the equipment, primarily for use by operation and maintenance personnel. All progress will be reported in the usual Monthly Progress Letter, and no quarterly reports will be submitted.

An RO-16A or Ri-16P Field Unit will be required by Contractor on this program, as GFP, to be used during the development and testing phases of the work.

Figure I is a simplified block diagram of the Field Unit Esceive System showing the technical approach which will be taken.

Figure II is a photograph of the standard shipping case in which each of the two components will be transported. The receiver and recorder components will operate within this case, or they may be removed and mounted on a standard relay rack for more permanent installations.





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DELIVERY SCHEDULE

Item 1. Six menths after receipt of signed contract.

Item 2. One each set per wonth, commencing seven months after receipt of signed contract.

Item 3. Bight months after receipt of signed contract.

NOTE:

This schedule is predicated on a forty-four (44) hour work week. As indicated in the estimated cost breakdown, Contractor anticipates 640 evertime hours for completion of Item 1 and 3 and 232 evertime hours for each additional BR-16 set. It is requested that any contract resulting from this proposal include authorization for commansurate evertime.

